EURODAM 8/4/17
VICTORIA

1/2

From: **Wladimirov, Sergej (HAL)** SWladimirov@HollandAmericaGroup.com
Subject: FW: VPS FQT Report HOU1725041 - EURODAM, Seattle, 23-Sep-2017. Spec met
Date: October 17, 2017 at 11:59 AM
To: McCracken, Steven (HAL) SMcCracken@HollandAmericaGroup.com

SW

From: Do not reply (VPS Houston) [mailto:GT700@v-p-s.com]
Sent: Wednesday, September 27, 2017 1:25 PM
To: Matthew, Robert (HAL); Waterworth, Dale (HAL); Wladimirov, Sergej (HAL)
Subject: VPS FQT Report HOU1725041 - EURODAM, Seattle, 23-Sep-2017. Spec met

To: CARNIVAL CORPORATION
Attn: Fuel Testing
To: EURODAM

Cc: HOLLAND AMERICA LINE
Attn: Matthew, Robert
Attn: Bakker, Jeen
Attn: Boksem, Rob
Attn: Diaz, Bob
Attn: Grabb, Daniel
Attn: Waterworth, Dale
Attn: Wladimirov, Sergej

Veritas Petroleum Services - Fuel Analysis Report dated: 27-Sep-2017

Vessel: **EURODAM (9378448)**

Sample Number	HOU1725041
Product Type	HFO
Fuel Usage	Main Engine
Bunker Port	Seattle
Bunker Date	23-Sep-2017
Supplier	TESORO
Loaded From	DUGAN PEARSALL
Quantity per C.Eng.	500 MT
Sent From	Seattle, Wa
Date Sent	25-Sep-2017
Arrived at Lab	26-Sep-2017
Sampling Point	Ship Manifold
Sampling Date	23-Sep-2017
Sampling Method	Continuous Drip
Seal Data	1510798 (VPS, Intact)
Related Samples	
Related Seals	1510799, 1510800
Marpol Seal	GW258366

Receipt Data	Value
Source Of Data	B.D.N.
Density @ 15°C	975.9 kg/m³
Viscosity @ 50°C	336.3 mm²/s
Sulfur	1.50 % m/m
Volume @ 60°F	3228.350 bbl
Quantity	500.170 MT

Tested Parameter	Unit	Result	RMG380
Density @ 15°C	kg/m³	971.9	991.0
Viscosity @ 50°C	mm²/s	270.3	380.0
Water	% V/V	< 0.1	0.5
Micro Carbon Residue	% m/m	13	18
Sulfur	% m/m	1.54	3.50
Total Sediment Potential	% m/m	0.03	0.10
Ash	% m/m	0.05	0.15
Vanadium	mg/kg	63	300
Calcium	mg/kg	15	30
Zinc	mg/kg	2	15
Phosphorus	mg/kg	6	15
Pour Point	°C	< 24	30
Flash Point	°C	> 70	60
Aluminium + Silicon	mg/kg	47	80

Sodium	mg/kg	17
Aluminium	mg/kg	19
Silicon	mg/kg	28
Iron	mg/kg	38
Nickel	mg/kg	27
Magnesium	mg/kg	2
Potassium	mg/kg	3
Net Specific Energy[1]	MJ/kg	40.94
CCAI (Ignition Quality)[1]	-	836

[1] Calculated value

Specification Comparison

Results compared with amended ISO 8217:2005 specification RMG380, table 2.
Based on this sample the specification is met.

Operational Advice

Al+Si - Fuel contains catalytic fines as indicated by aluminium + silicon. Increased wear of liners, piston rings, injectors and fuel pumps is likely when these highly abrasive particles are not reduced by at least 70%.
Separators - Fuel temperature at separator inlet should be maintained at a constant temperature of 98 °C. Ensure a constant flow rate through the separator at a reduced rate. Consider to operate separators in parallel. Cleaning the disc stack of the separators in use will further improve the efficiency.
Fuel System Check - Based on the high concentration of impurities, we recommend to send a set of FSC samples to assess the efficiency and confirm optimum operation of the fuel treatment plant. As a minimum, representative samples taken before and after the separators are required for this assessment. Please refer to the Instruction Manual included in the sample kits for more detailed information.

Temperatures

Injection	135 °C for 10 mm²/s, 120 °C for 15 mm²/s, 110 °C for 20 mm²/s, 105 °C for 25 mm²/s
Transfer	40 °C

Calculated Weight
498.084 MT
Calculated Mass
498.649 MT

The calculated quantities are based on BDN Volume and tested density. A weight factor of 1.1 kg/m³ (ASTM D1250-80 Table 56) has been applied to calculate the weight.

Best Regards,
On behalf of Veritas Petroleum Services BV
Leonardo Alphonso
Technical Adviser

For assistance or further information on this report please contact your nearest VPS office or contact us directly at Tel : +1 (281) 470 1030, Email : Houston@v-p-s.com

NADM 9/25 JUNEAU
9/28 KETCHIKAN
9/4 JUNEAU

MARINE PETROBULK LP

10 PEMBERTON AVENUE
NORTH VANCOUVER, BC V7P 2R1 604-987-4415

MARINE FUEL OILS - BUNKER RECEIPT

RECEIVING VESSEL ☐ MV Nieuw Amsterdam	DOCK / PORT Vancouve rBC	DATE Sept. 2 2017
VESSEL IMO NUMBER 9378450	ACCOUNT Holland Americaline	☒ Barge PB 32
LOCAL AGENTS Holland		☐ Barge PB 34
		☐ Barge Petrobulker

ISO 8217 (2010) RMG380	IFO 380 3.5% Sulphur		LS MGO (DMA)	
DENSITY @ 15 C.	0.9686		0.8555	
GROSS MEASURED QUANTITY	682,085		252,105	
AVERAGE TEMPERATURE	45	°C	30	°C
TEMP. ADJ. COEFFICIENT	.9867		.9896	
NET LITRES @ 15 C.	671,076		248,975	
DELIVERED QUANTITY IN METRIC TONS	- 650 -		- 213 -	

FUEL PROPERTIES				
VISCOSITY (Cst) @ 50 °C	350		2.7	
SULPHUR (% by wt.)	1.70% ☆		0.0008%	
B.S. or W (% by vol)	0.1%		NIL	
FLASH POINT (PMCC)	74+	°C	68+	°C
POUR POINT	-8	°C	-18	°C
API GRAVITY @ 60 °F.	14.5		33.8	

BARGE	
MADE FAST	DATE 09-02
	TIME 0900
HOSE CONNECTED	DATE 09-02
	TIME 0920
BEGAN PUMPING	DATE 09-02
	TIME 0930
FINISHED PUMPING	DATE 09-02
	TIME 1505
TOTAL PUMPING TIME	5 HRS.
	30 MIN.

REMARKS
We certify that the bunker fuel oil delivered meets the requirements of regulations 14 and 18 of Annex V1 of MARPOL 73/78.

SAMPLE SEAL NUMBERS: GW 280391
GW 280397
GW 707260
GW 707472

☒ YES ☐ NO SHIPS ENGINEER INVITED TO WITNESS SOUNDINGS
☒ YES ☐ NO SHIPS ENGINEER WITNESSED SOUNDINGS
☒ YES ☐ NO REPRESENTATIVE SAMPLE(S) OF THIS DELIVERY PASSED TO SHIPS ENGINEER.

THE QUANTITIES DELIVERED WERE CALCULATED ON THE BASIS OF THE MEASUREMENTS OF THE SUPPLIERS TANKS OR METERS. TAKEN BEFORE AND AFTER THE DELIVERY AND WILL BE CONTROLLING. THEY WILL NOT BE ADJUSTED BASED ON ULLAGES OF THE VESSELS TANK.

Holland America line
M/S "NIEUW AMSTERDAM"
- CHIEF ENGINEER -

BY [signature] DATE Sept. 2 2017

TITLE: CE BUNKER DELIVERY RECEIPT # 2017-2262

BY ______________
TANKERMAN

NADM 9/25 JUNEAU
9/28 KETCHIKAN
9/4 JUNEAU

Source Of Data	B.D.N.
Density @ 15°C	968.6kg/m³
Viscosity @ 50°C	350.0mm²/s
Sulfur	1.70% m/m
Volume @ 15°C	671.076m³
Quantity	650.000MT

Test Parameter	Unit	Result	RMG380
Density @ 15°C	kg/m³	966.1	991.0
Viscosity @ 50°C	mm²/s	339.6	380.0
Water	% V/V	0.1	0.5
Micro Carbon Residue	% m/m	14	18
Sulfur	% m/m	1.76	3.50
Total Sediment Potential	% m/m	0.01	0.10
Ash	% m/m	0.05	0.15
Vanadium	mg/kg	73	300
Calcium	mg/kg	5	30
Zinc	mg/kg	2	15
Phosphorus	mg/kg	1	15
Pour Point	°C	< 24	30
Flash Point	°C	> 70	60
Aluminium + Silicon	mg/kg	37	80
Sodium	mg/kg	31	
Aluminium	mg/kg	15	
Silicon	mg/kg	22	
Iron	mg/kg	22	
Nickel	mg/kg	31	
Magnesium	mg/kg	< 1	
Potassium	mg/kg	1	
Net Specific Energy[1]	MJ/kg	40.93	
CCAI (Ignition Quality)[1]	-	828	

[1] Calculated value

Specification Comparison

Results compared with amended ISO 8217:2005 specification RMG380, table 2.
Based on this sample the specification is met.

Temperatures

Injection - 140 °C for 10 mm²/s, 125 °C for 15 mm²/s, 115 °C for 20 mm²/s,
105 °C for 25 mm²/s
Transfer - 40 °C

Calculated Weight

647.588 MT

CORAL PRINCESS

MARINE PETROBULK LP

Sept 5. 2017 JUNEAU

10 PEMBERTON AVENUE
NORTH VANCOUVER, BC V7P 2R1 604-987-4415

MARINE FUEL OILS - BUNKER RECEIPT

RECEIVING VESSEL	DOCK / PORT	DATE
☐ MV Coral Princess	Vancouver BC	02-09-2017

VESSEL IMO NUMBER	ACCOUNT	
9229359	Princess Cruise Lines	☐ Barge PB 32
LOCAL AGENTS		☒ Barge PB 34
Princess		☐ Barge Petrobulker

ISO 8217 (2010) RMG 380	IFO 380 3.5% Sulphur	LS MGO (DMA)
DENSITY @ 15 C.	0.9753	0.8555
GROSS MEASURED QUANTITY	778.2 m³	574.7 m³
AVERAGE TEMPERATURE	42 °C	37 °C
TEMP. ADJ. COEFFICIENT	0.9811	0.9818
NET LITRES @ 15 C.	763492	564240
DELIVERED QUANTITY IN METRIC TONS	744.6 mT	482.7 mT

FUEL PROPERTIES		
VISCOSITY (Cst) @ 50 °C	362	2.7
SULPHUR (% by wt.)	1.7%	0.0008%
B.S. or W (% by vol)	0.1%	NIL
FLASH POINT (PMCC)	68+ °C	68+ °C
POUR POINT	-8 °C	-18 °C
API GRAVITY @ 60 °F.	13.5	33.8

BARGE

MADE FAST
DATE
TIME

HOSE CONNECTED
DATE
TIME

BEGAN PUMPING
DATE 02-09-2017
TIME 0828

FINISHED PUMPING
DATE --
TIME 1141

TOTAL PUMPING TIME
HRS.
MIN.

REMARKS

We certify that the bunker fuel oil delivered meets the requirements of regulations 14 and 18 of Annex V1 of MARPOL 73/78.

SAMPLE SEAL NUMBERS:

MGO Ship - GW 280030
Barge - GW 276332

HFO Ship - GW 289736
Barge - GW 273822

☐YES ☐NO SHIPS ENGINEER INVITED TO WITNESS SOUNDINGS

☐YES ☐NO SHIPS ENGINEER WITNESSED SOUNDINGS

☐YES ☐NO REPRESENTATIVE SAMPLE(S) OF THIS DELIVERY PASSED TO SHIPS ENGINEER.

THE QUANTITIES DELIVERED WERE CALCULATED ON THE BASIS OF THE MEASUREMENTS OF THE SUPPLIERS TANKS OR METERS. TAKEN BEFORE AND AFTER THE DELIVERY AND WILL BE CONTROLLING. THEY WILL NOT BE ADJUSTED BASED ON ULLAGES OF THE VESSELS TANK.

M/V CORAL PRINCESS
SEP 02 2017
CHIEF ENGINEER

BY (X) _____ TITLE: Clerk

BY _____ TANKERMAN

DATE 2nd September 2017

BUNKER DELIVERY RECEIPT # 207-32052

Ships Copy

CORAL PRINCESS 1/3
9/5 JUNEAU

From: **Valerie Chatterley** vchatterley@venveco.com
Subject: Fwd: VPS FQT Report HOU1723197 - CORAL PRINCESS, Vancouver (Ca), 02-Sep-2017. Spec met
Date: October 15, 2017 at 1:44 PM
To:

VC

To: CARNIVAL CORPORATION
Attn: Fuel Testing

To: CORAL PRINCESS

Cc: PRINCESS CRUISES
Attn: Lindner, Karen
Attn: Womersley, Andrew
Attn: Baldwin, Hugh
Attn: Kent, James

Cc: WARTSILA NORTH AMERICA INC
Attn: Fluids

Cc: HOLLAND AMERICA LINE
Attn: Di Pietro, Orazio

Veritas Petroleum Services - Fuel Analysis Report dated: 08-Sep-2017

Vessel: CORAL PRINCESS (9229659)

Sample Number	HOU1723197
Product Type	HFO
Fuel Usage	Main Engine
Bunker Port	Vancouver (Ca)
Bunker Date	02-Sep-2017
Supplier	MARINE PET
Loaded From	PB 34
Quantity per C.Eng.	UNKNOWN MT
Sent From	Ketchikan
Date Sent	05-Sep-2017
Arrived at Lab	07-Sep-2017
Sampling Point	Ship Manifold
Sampling Date	02-Sep-2017
Sampling Method	Continuous Drip

Seal Data 1055231 (VPS, Intact)

Related Samples

Related Seals 1055232, 1138378, 1138379

Receipt Data	Value
Source Of Data	B.D.N.
Density @ 15°C	975.3kg/m³
Viscosity @ 50°C	362.0mm²/s
Sulfur	1.70% m/m
Volume @ 15°C	763.492m³
Quantity	744.600MT

Test Parameter	Unit	Result	RMG380
Density @ 15°C	kg/m³	973.9	991.0
Viscosity @ 50°C	mm²/s	348.7	380.0
Water	% V/V	< 0.1	0.5
Micro Carbon Residue	% m/m	13	18
Sulfur	% m/m	1.32	3.50
Total Sediment Potential	% m/m	0.03	0.10
Ash	% m/m	0.07	0.15
Vanadium	mg/kg	48	300
Calcium	mg/kg	27	30
Zinc	mg/kg	4	15
Phosphorus	mg/kg	3	15
Pour Point	°C	< 24	30
Flash Point	°C	> 70	60
Aluminium + Silicon	mg/kg	40	80
Sodium	mg/kg	41	
Aluminium	mg/kg	11	
Silicon	mg/kg	29	
Iron	mg/kg	77	
Nickel	mg/kg	23	
Magnesium	mg/kg	4	
Potassium	mg/kg	3	
Net Specific Energy[1]	MJ/kg	40.97	
CCAI (Ignition Quality)[1]	-	836	

[1] Calculated value

Specification Comparison

Results compared with amended ISO 8217:2005 specification RMG380, table 2.
Based on this sample the specification is met.

Temperatures

Injection - 140 °C for 10 mm²/s, 125 °C for 15 mm²/s, 115 °C for 20 mm²/s, 105 °C for 25 mm²/s
Transfer - 40 °C

Calculated Weight

742.725 MT

Calculated Mass

743.565 MT

The calculated quantities are based on BDN Volume and tested density. A weight factor of 1.1 kg/m³ (ASTM D1250-80 Table 56) has been applied to calculate the weight.
Best Regards,
On behalf of Veritas Petroleum Services BV
Qamar Hussain
Technical Adviser

If not properly aligned, please change font to Courier New, size 10.

Reference to part(s) of this report which may lead to misinterpretation is prohibited.

For assistance or further information on this report please contact your nearest VPS office or contact us directly at Tel : +1 (281) 470 1030, Email : Houston@v-p-s.com<mailto:Houston@v-p-s.com>

ZADM 9/6 Jumeau

MARINE PETROBULK LP

10 PEMBERTON AVENUE
NORTH VANCOUVER, BC V7P 2R1 604-987-4415

MARINE FUEL OILS - BUNKER RECEIPT

RECEIVING VESSEL	DOCK / PORT	DATE
☐ MV ZAANDAM	VANCOUVER BC	AUG. 6, 2017

VESSEL IMO NUMBER	ACCOUNT	
9156527	HOLLAND AMERICA LINES INC.	☐ Barge PB 32
LOCAL AGENTS		☐ Barge PB 34
HOLLAND		☒ Barge Petrobulker

ISO 8217 (2010)	IFO 380 3.5% Sulphur	LS MGO (DMA)	BARGE
DENSITY @ 15 C.	0.9699	0.8535	MADE FAST DATE TIME
GROSS MEASURED QUANTITY	1063.4 m^3	296.6 m^3	
AVERAGE TEMPERATURE	58 °C	30 °C	HOSE CONNECTED DATE TIME
TEMP. ADJ. COEFFICIENT	0.9696	0.9876	
NET LITRES @ 15 C.	1031 072	292 922	BEGAN PUMPING
DELIVERED QUANTITY IN METRIC TONS	1000 MT	250 MT	DATE 06.08.2017 TIME 0832
FUEL PROPERTIES			
VISCOSITY (Cst) @ 50 °C	360	2.8	FINISHED PUMPING DATE TIME 0857
SULPHUR (% by wt.)	1.85%	0.000?%	
B.S. or W (% by vol)	0.12	NIL	TOTAL PUMPING TIME
FLASH POINT (PMCC)	78° °C	70° °C	
POUR POINT	-4 °C	-14 °C	HRS.
API GRAVITY @ 60 °F.	~~34.2~~ 14.3	2 34.2	MIN.

REMARKS

We certify that the bunker fuel oil delivered meets the requirements of regulations 14 and 18 of Annex V1 of MARPOL 73/78.

SAMPLE SEAL NUMBERS:

MGO — Ship - GW 085879, Barge - GW 085885

HFO — Ship - GW 277242, Barge - GW 277221

☐YES ☐NO SHIPS ENGINEER INVITED TO WITNESS SOUNDINGS

☐YES ☐NO SHIPS ENGINEER WITNESSED SOUNDINGS

☐YES ☐NO REPRESENTATIVE SAMPLE(S) OF THIS DELIVERY PASSED TO SHIPS ENGINEER.

THE QUANTITIES DELIVERED WERE CALCULATED ON THE BASIS OF THE MEASUREMENTS OF THE SUPPLIERS TANKS OR METERS. TAKEN BEFORE AND AFTER THE DELIVERY AND WILL BE CONTROLLING. THEY WILL NOT BE ADJUSTED BASED ON ULLAGES OF THE VESSEL'S TANK.

HOLLAND AMERICA LINE ZAANDAM CHIEF ENGINEER

BY (X) +Stamp

BY Eng

TANKERMAN

DATE 6th August 2017

BUNKER DELIVERY RECEIPT # 2017-3144

Ships Copy

ZADM-Chief Engineer (HAL) ZADM 1/3

From: Do not reply (VPS Houston) <GT700@v-p-s.com>
Sent: Saturday, August 12, 2017 12:02 PM
To: ftesting@carnival.com; ZADM-Chief Engineer (HAL)
Cc: Bakker, Jeen (HAL); Boksem, Rob (HA Group); Diaz, Bob (HAL); Grabb, Daniel (HAL)
Subject: VPS FQT Report HOU1721282 - ZAANDAM, Vancouver (Ca), 06-Aug-2017. Spec met

To: CARNIVAL CORPORATION
Attn: Fuel Testing

To: ZAANDAM

Cc: HOLLAND AMERICA LINE
Attn: Matthew, Robert
Attn: Bakker, Jeen
Attn: Boksem, Rob
Attn: Diaz, Bob
Attn: Grabb, Daniel

Veritas Petroleum Services - Fuel Analysis Report dated: 12-Aug-2017

Vessel: ZAANDAM (9156527)

Sample Number	HOU1721282
Product Type	HFO
Fuel Usage	Not Stated
Bunker Port	Vancouver (Ca)
Bunker Date	06-Aug-2017
Supplier	MARINE PET
Loaded From	PETROBULKER
Quantity per C.Eng.	1000 MT
Sent From	Seattle, Wa
Date Sent	08-Aug-2017
Arrived at Lab	11-Aug-2017
Sampling Point	Ship Manifold
Sampling Date	06-Aug-2017
Sampling Method	Continuous Drip

Seal Data 1249494 (VPS, Intact)

Related Samples

Related Seals	1249495, 1249496
Marpol Seal	GW277242

ZADM 2/3

Receipt Data	Value
Source Of Data	B.D.N.
Density @ 15°C	969.9kg/m³
Viscosity @ 50°C	360.0mm²/s
Sulfur	1.85% m/m
Volume @ 15°C	1031.072m³
Quantity	1000.000MT

Test Parameter	Unit	Result	RMG380	
Density @ 15°C	kg/m³	968.2	991.0	
Viscosity @ 50°C	mm²/s	361.9	380.0	
Water	% V/V	0.1	0.5	
Micro Carbon Residue	% m/m	14	18	
Sulfur	% m/m	1.81	3.50	
Total Sediment Potential	% m/m	0.01	0.10	
Ash	% m/m	0.04	0.15	
Vanadium	mg/kg	84	300	
Sodium	mg/kg	26		
Aluminium	mg/kg	18		
Silicon	mg/kg	24		
Iron	mg/kg	18		
Nickel	mg/kg	35		
Calcium	mg/kg	5	30	
Magnesium	mg/kg	< 1		
Zinc	mg/kg	< 1	15	
Phosphorus	mg/kg	< 1	15	
Potassium	mg/kg	< 1		
Pour Point	°C	< 24	30	
Flash Point	°C	> 70	60	
Net Specific Energy[1]	MJ/kg	40.88		
CCAI (Ignition Quality)[1]	-	830		
Aluminium + Silicon	mg/kg	42	80	

[1] Calculated value

Specification Comparison

Results compared with amended ISO 8217:2005 specification RMG380, table 2.
Based on this sample the specification is met.

Operational Advice

Al+Si - Fuel contains catalytic fines as indicated by aluminium + Al+silicon. Increased wear of liners, piston rings, injectors and fuel pumps is likely when these highly abrasive particles are not reduced by at least 67%.

Separators - Fuel temperature at separator inlet should be maintained at a constant temperature of 98 °C. Ensure a constant flow rate through the separator at a reduced rate.
Consider to operate separators in parallel. Cleaning the disc stack of the separators in use will further improve the efficiency.

Fuel System Check - Based on the high concentration of impurities, we recommend to send a set of FSC samples to assess the efficiency and confirm optimum operation of the fuel treatment plant. As a minimum, representative samples taken before and after the separators are required for this assessment. Please refer to the Instruction Manual included in the sample kits for more detailed information.

Temperatures

Injection - 145 °C for 10 mm^2/s, 125 °C for 15 mm^2/s, 115 °C for 20 mm^2/s,
110 °C for 25 mm^2/s
Transfer - 45 °C

Calculated Weight

997.150 MT

Calculated Mass

998.284 MT

The calculated quantities are based on BDN Volume and tested density. A weight factor of 1.1 kg/m^3 (ASTM D1250-80 Table 56) has been applied to calculate the weight.
Best Regards,
On behalf of Veritas Petroleum Services BV Christian Ryder Technical Manager

If not properly aligned, please change font to Courier New, size 10.

Reference to part(s) of this report which may lead to misinterpretation is prohibited.

For assistance or further information on this report please contact your nearest VPS office or contact us directly at Tel : +1 (281) 470 1030, Email : Houston@v-p-s.com

VODM
JUNEAU 9/8
Ketchikan 9/11

MARINE PETROBULK LP

10 PEMBERTON AVENUE
NORTH VANCOUVER, BC V7P 2R1 604-987-4415

MARINE FUEL OILS - BUNKER RECEIPT

RECEIVING VESSEL ☐ MV Volendam	DOCK / PORT Vancouver BC	DATE Aug 2/17	
VESSEL IMO NUMBER 9156515	ACCOUNT Holland AmericalIne		☐ Barge PB 32
LOCAL AGENTS holland			☒ Barge PB 34
			☐ Barge Petrobulker

ISO 8217 (2010) Rmg 380	IFO 380 3.5% Sulphur	LS MGO (DMA)
DENSITY @ 15 C.	0.9699	0.8535
GROSS MEASURED QUANTITY	630,273	475,465
AVERAGE TEMPERATURE	41° °C	32° °C
TEMP. ADJ. COEFFICIENT	.9817	.9859
NET LITRES @ 15 C.	618,739	468,760
DELIVERED QUANTITY IN METRIC TONS	600.114	400.056
FUEL PROPERTIES		
VISCOSITY (Cst) @ 50 °C	368	2.8
SULPHUR (% by wt.)	1.862	0.00082
B.S. or W (% by vol)	0.1	NIL
FLASH POINT (PMCC)	78 °C	70° °C
POUR POINT	-4 °C	-14 °C
API GRAVITY @ 60 °F.	14.3	34.2

BARGE

MADE FAST	DATE Aug 2/17 TIME 0900
HOSE CONNECTED	DATE Aug 2/17 TIME 0900
BEGAN PUMPING	DATE Aug 2/17 TIME 0910
FINISHED PUMPING	DATE Aug 2/17 TIME 1420
TOTAL PUMPING TIME	5 HRS. 10 MIN.

REMARKS
We certify that the bunker fuel oil delivered meets the requirements of regulations 14 and 18 of Annex V1 of MARPOL 73/78.

SAMPLE SEAL NUMBERS:
MGO Ship's-277923
Barge-277798
IF.380 Ship's-277842.
Barge's-277810

☒ YES	☐ NO	SHIPS ENGINEER INVITED TO WITNESS SOUNDINGS
☒ YES	☐ NO	SHIPS ENGINEER WITNESSED SOUNDINGS
☒ YES	☐ NO	REPRESENTATIVE SAMPLE(S) OF THIS DELIVERY PASSED TO SHIPS ENGINEER.

THE QUANTITIES DELIVERED WERE CALCULATED ON THE BASIS OF THE MEASUREMENTS OF THE SUPPLIERS TANKS OR METERS. TAKEN BEFORE AND AFTER THE DELIVERY AND WILL BE CONTROLLING. THEY WILL NOT BE ADJUSTED BASED ON ULLAGES OF THE VESSELS TANK.

BY [signature] (Stamp: Volendam, Chief Engineer)
TITLE: CE

DATE Aug 2/17
BUNKER DELIVERY RECEIPT # 2017-345

BY Charles Sceine
TANKERMAN

VODM-Chief Engineer (HAL) VODM 1/2

From: Do not reply (VPS Houston) <GT700@v-p-s.com>
Sent: Thursday, August 10, 2017 1:02 PM
To: ftesting@carnival.com; VODM-Chief Engineer (HAL)
Cc: Bakker, Jeen (HAL); Boksem, Rob (HA Group); Diaz, Bob (HAL); Grabb, Daniel (HAL)
Subject: VPS FQT Report HOU1721065 - VOLENDAM, Vancouver (Ca), 02-Aug-2017. Spec met

To: CARNIVAL CORPORATION
Attn: Fuel Testing

To: VOLENDAM

Cc: HOLLAND AMERICA LINE
Attn: Matthew, Robert
Attn: Bakker, Jeen
Attn: Boksem, Rob
Attn: Diaz, Bob
Attn: Grabb, Daniel

Veritas Petroleum Services - Fuel Analysis Report dated: 10-Aug-2017

Vessel: VOLENDAM (9156515)

Sample Number	HOU1721065
Product Type	HFO
Fuel Usage	Main Engine
Bunker Port	Vancouver (Ca)
Bunker Date	02-Aug-2017
Supplier	MARINE PET
Loaded From	PB 34
Quantity per C.Eng.	600 MT
Sent From	Vancouver-Downtown, Bc
Date Sent	02-Aug-2017
Arrived at Lab	09-Aug-2017
Sampling Point	Ship Manifold
Sampling Date	02-Aug-2017
Sampling Method	Continuous Drip

Seal Data 0570755 (VPS, Intact)

Related Samples

Related Seals 0570756, 0570757, 0570758

Receipt Data	Value
Source Of Data	B.D.N.
Density @ 15°C	969.9kg/m³

Viscosity @ 50°C	368.0mm²/s
Sulfur	1.86% m/m
Volume @ 15°C	618.739m³
Quantity	600.114MT

Test Parameter	Unit	Result	RMG380
Density @ 15°C	kg/m³	968.6	991.0
Viscosity @ 50°C	mm²/s	376.6	380.0
Water	% V/V	0.1	0.5
Micro Carbon Residue	% m/m	15	18
Sulfur	% m/m	1.95	3.50
Total Sediment Potential	% m/m	0.01	0.10
Ash	% m/m	0.04	0.15
Vanadium	mg/kg	84	300
Sodium	mg/kg	27	
Aluminium	mg/kg	19	
Silicon	mg/kg	24	
Iron	mg/kg	20	
Nickel	mg/kg	35	
Calcium	mg/kg	5	30
Magnesium	mg/kg	< 1	
Zinc	mg/kg	1	15
Phosphorus	mg/kg	1	15
Potassium	mg/kg	1	
Pour Point	°C	< 24	30
Flash Point	°C	> 70	60
Net Specific Energy[1]	MJ/kg	40.83	
CCAI (Ignition Quality)[1]	-	830	
Aluminium + Silicon	mg/kg	43	80

[1] Calculated value

Specification Comparison

Results compared with amended ISO 8217:2005 specification RMG380, table 2.
Based on this sample the specification is met.

Operational Advice

Al+Si - Fuel contains catalytic fines as indicated by aluminium + Al+silicon. Increased wear of liners, piston rings, injectors and fuel pumps is likely when these highly abrasive particles are not reduced by at least 67%.

Separators - Fuel temperature at separator inlet should be maintained at a constant temperature of 98 °C. Ensure a constant flow rate through the separator at a reduced rate.
Consider to operate separators in parallel. Cleaning the disc stack of the separators in use will further improve the efficiency.

Fuel System Check - Based on the high concentration of impurities, we recommend to send a set of FSC samples to assess the efficiency and confirm optimum operation of the fuel treatment plant. As a minimum, representative samples taken before and after the separators are required for this assessment. Please refer to the Instruction Manual included in the sample kits for more detailed information.

Temperatures

Injection - 145 °C for 10 mm^2/s, 125 °C for 15 mm^2/s, 115 °C for 20 mm^2/s,
110 °C for 25 mm^2/s
Transfer - 45 °C

Calculated Weight

598.630 MT

Calculated Mass

599.311 MT

The calculated quantities are based on BDN Volume and tested density. A weight factor of 1.1 kg/m^3 (ASTM D1250-80 Table 56) has been applied to calculate the weight.
Best Regards,
On behalf of Veritas Petroleum Services BV Leonardo Alphonso Technical Adviser

If not properly aligned, please change font to Courier New, size 10.

For assistance or further information on this report please contact your nearest VPS office or contact us directly at Tel : +1 (281) 470 1030, Email : Houston@v-p-s.com

RUBY PRINCESS
JUNEAU 9/26/17
KETCHIKAN 9/28/17

Tesoro Refining and Marketing Company LLC

19100 Ridgewood Parkway

San Antonio, TX 78259

210-626-6000

TESORO

Receipt Number	Part of Total	Supplying Installation	Delivery Port	Code	Port Subdivision	Code
B TMS1751D1		Paramount	Seattle		P-91	

Nomination Number	Customer Code	Delivery Barge
17E0050		Shauna Kay

Vessel Name	IMO #	Tanker Code	
Ruby Princess	9378462		Cleared Foreign ~1 Cleared Coastal ~2 Offloading ~3

Date Delivery Commenced	Method of Delivery	Foreign Destination
6/3/2017	BARGE	

DYED DIESEL FUEL
NON-TAXABLE USE ONLY
PENALTY FOR TAXABLE USE

Grade Name	Volume Delivered Gross BBLS	Net BBLS	API Gravity @ 60F	Temp F	Invoice Quantity Weight M.T.	Density @15 C	Actual Viscosity of Fuel Oil -cSt Kinematic @ 50C	Flashpoint According to PMCC	Duty Paid	Sulfur
DMA	4412.25	4399.20	33.1	66.5	**599.92**	0.8592	2.936	156		0.00081
RMG 380	3958.46	3843.29	12.1	135.8	**600.86**	0.9848	368.4	210		1.64

Remarks: SDS ISSUED TO SHIP

SAMPLE SEAL NUMBERS

	M	S	B1	B2
DMA	M GW181436	S GW181427	B1 GW181415	B2 GW181447
RMG 380	M GW181419	S GW181428	B1 GW181356	B2 GW181392
	M	S	B1	B2
	M	S	B1	B2

The fuel supplied in this delivery is in compliance with latest provisions of Annex VI of Marpol 73/78 regulations 14 and 18, as amended. Fuel received is for the use as bunkers, together with the representative sample. The quantities shown above are subject to correction in case of error.

No disclaimer stamp of any type or form will be accepted on this Marine Bunker Receipt. Should any stamp be applied, it will not alter, change or waive the seller's maritime lien against the vessel, or waive the vessel's ultimate responsibility for the debt incurred through this transaction.

N. Marx Jr. Supplier's Representative

Received for use as bunkers, together with a representative sample, the quantities shown above.

Master/Chief Engineer

Charge Description	Code	Charge Rate	Currency L=Local D=US$	B=Bbl L=Lump P=%Value	Grade	Quantity	Unit

Ruby Princess
1/3

To: CARNIVAL CORPORATION
Attn: Fuel Testing

To: RUBY PRINCESS

Cc: PRINCESS CRUISES
Attn: Lindner, Karen
Attn: Kent, James
Attn: Susino, Piero

Cc: WARTSILA NORTH AMERICA INC
Attn: Fluids

Veritas Petroleum Services - Fuel Analysis Report dated: 27-Sep-2017

Vessel: RUBY PRINCESS (9378462)

Sample Number	HOU1725036
Product Type	HFO
Fuel Usage	Not Stated
Bunker Port	Seattle
Bunker Date	23-Sep-2017
Supplier	TESORO
Loaded From	SHAUNA KAY
Quantity per C.Eng.	600 MT
Sent From	Seattle, Wa
Date Sent	25-Sep-2017
Arrived at Lab	26-Sep-2017
Sampling Point	Ship Manifold
Sampling Date	23-Sep-2017
Sampling Method	Continuous Drip

Seal Data 0877875 (VPS, Intact)

Related Samples

Related Seals	0877876, 0877877, 0877878
Marpol Seal	273765

Receipt Data	Value
Source Of Data	B.D.N.
Density @ 15°C	975.9kg/m³
Viscosity @ 50°C	336.3mm²/s
Sulfur	1.50% m/m
Volume @ 60°F	3874.770bbl
Quantity	600.320MT

Test Parameter	Unit	Result	RMG380

Density @ 15°C	kg/m³	975.1	991.0
Viscosity @ 50°C	mm²/s	332.1	380.0
Water	% V/V	< 0.1	0.5
Micro Carbon Residue	% m/m	13	18
Sulfur	% m/m	1.57	3.50
Total Sediment Potential	% m/m	0.01	0.10
Ash	% m/m	0.05	0.15
Vanadium	mg/kg	65	300
Calcium	mg/kg	15	30
Zinc	mg/kg	2	15
Phosphorus	mg/kg	6	15
Pour Point	°C	< 24	30
Flash Point	°C	> 70	60
Aluminium + Silicon	mg/kg	47	80
Sodium	mg/kg	17	
Aluminium	mg/kg	19	
Silicon	mg/kg	28	
Iron	mg/kg	39	
Nickel	mg/kg	29	
Magnesium	mg/kg	2	
Potassium	mg/kg	3	
Net Specific Energy[1]	MJ/kg	40.89	
CCAI (Ignition Quality)[1]	-	837	

[1] Calculated value

Specification Comparison

Results compared with amended ISO 8217:2005 specification RMG380, table 2.
Based on this sample the specification is met.

Operational Advice

Al+Si - Fuel contains catalytic fines as indicated by aluminium + silicon. Increased wear of liners, piston rings, injectors and fuel pumps is likely when these highly abrasive particles are not reduced by at least 70%.

Separators - Fuel temperature at separator inlet should be maintained at a constant temperature of 98 °C. Ensure a constant flow rate through the separator at a reduced rate. Consider to operate separators in parallel. Cleaning the disc stack of the separators in use will further improve the efficiency.

Fuel System Check - Based on the high concentration of impurities, we recommend to send a set of FSC
samples to assess the efficiency and confirm optimum operation of the fuel treatment plant. As a minimum, representative samples taken before and after the separators are required for this assessment. Please refer to the Instruction Manual included in the sample kits for more detailed information.

Temperatures

Injection - 140 °C for 10 mm²/s, 125 °C for 15 mm²/s, 115 °C for 20 mm²/s,
105 °C for 25 mm²/s
Transfer - 40 °C

Calculated Weight

599.788 MT

Calculated Mass

600.466 MT

The calculated quantities are based on BDN Volume and tested density. A weight factor of 1.1 kg/m³ (ASTM D1250-80 Table 56) has been applied to calculate the weight.
Best Regards,
On behalf of Veritas Petroleum Services BV
Leonardo Alphonso
Technical Adviser

If not properly aligned, please change font to Courier New, size 10.

For assistance or further information on this report please contact your nearest VPS office or contact us directly at Tel : +1 (281) 470 1030, Email : Houston@v-p-s.com

GRAND PRINCESS
SKAGWAY SEPT. 9, 2017

600 North Dairy Ashford
P.O. Box 4428
Houston, TX 77210
Phone: (281) 293-1000

Bunker Delivery Receipt

Vessel Name / IMO #	Flag	Date
GRAND PRINCESS 9104005	BERMUDA	9-5-2017
Terminal Location	**Delivery Location / Port**	
RICHMOND CA	SAN FRANCISCO 21 CA	

Product Description	Weight (MT)	Gross Barrels	Net Barrels	Gravity API	Density @ 15° C	Visc. CST @ 50° C	Temp° F	Flash° F	Pour° F	Sulphur % Wt.
LSMGO	450.77	3481.65	3434.30	34.5	832.1	2.268	88°	149	No Data	.0002
RMG 380	950.78	6644.26	6128.12	13.2	977.3	337.3	108°	172	10	1.74

MGO Sample Seal Numbers RMG	Remarks		Date	Time
MARPOL GW292871 / GW292863		Barge Along Side	9-5-2017	0700
Supplier N/A		Hose Connected		0755
Ship GW292902 / GW292857		Started Pumping		0825
Barge GW292869 / GW292880		Finished Pumping		1320
		Hose Disconnected		
		Barge Away		

No disclaimer of any type or form will be accepted on the Marine Bunker Delivery Receipt, and if any words of disclaimer are applied, they will not alter, impair or waive Phillip66 Company's maritime lien against the vessel or affect the vessel's ultimate responsibility for the debt incurred through this transaction.
The fuel delivered conforms with Regulations 14(1) and 18(1) of Annex VI MARPOL 73/78.
All disputes arising from this sale shall be resolved in accordance with Maritime law of the United States of America.

Vessel's Next Destination

Samples Given to Chief Engineer (Signature)	Ship's Engineer Invited to Check Gauges	Gauges Witnessed by Ship's Rep.
	☑ Yes ☐ No	☐ Yes ☑ No

Delivering Company	Received for use as bunkers, together with representative sample, the quantities shown above. Exact quantities shown are subject to correction in case of error.
STARBOARD MARINE SERVICES	
By (Signature)	Master / Chief Engineer (Signature) MV GRAND PRINCESS
	SEP 05 2017
Date 9-5-2017	Date CHIEF ENGINEER OFFICER

9-73 F, 1-15

G. PRINCESS 1/3

"Do not reply (VPS Houston)" <GT700@v-p-s.com>
AP
08/09/2017 12:15
Please respond to "Do not reply (VPS Houston)" <GT700@v-p-s.com>

To <ftesting@carnival.com>, <aptctec1@princesscruises.com>,
cc <fluids.pbl@wartsila.com>, <klindner@princesscruises.com>, <chager@hagroup.com>, <jakent@princesscruises.com>
bcc
Subject VPS FQT Report HOU1723226 - GRAND PRINCESS, San Francisco, 05-Sep-2017. Spec met

To: CARNIVAL CORPORATION
Attn: Fuel Testing

To: GRAND PRINCESS

Cc: WARTSILA NORTH AMERICA INC
Attn: Fluids

Cc: PRINCESS CRUISES
Attn: Lindner, Karen
Attn: Hager, Charles
Attn: Kent, James

Veritas Petroleum Services - Fuel Analysis Report dated: 08-Sep-2017

Vessel: GRAND PRINCESS (9104005)

Sample Number	HOU1723226
Product Type	HFO
Fuel Usage	Main Engine
Bunker Port	San Francisco
Bunker Date	05-Sep-2017
Supplier	PHILLIPS 66
Loaded From	BERNIE BRIERE
Quantity per C.Eng.	950 MT
Sent From	San Francisco
Date Sent	05-Sep-2017
Arrived at Lab	07-Sep-2017
Sampling Point	Ship Manifold
Sampling Date	05-Sep-2017
Sampling Method	Continuous Drip
Seal Data	1505151 (VPS, Intact)

Related Samples	
Related Seals	1505152, 1505153, 1505154
Marpol Seal	GW292863

Receipt Data	Value
Source Of Data	B.D.N.
Density @ 15°C	977.3kg/m³
Viscosity @ 50°C	337.3mm²/s
Sulfur	1.74% m/m

Volume @ 60°F	6128.120bbl
Quantity	950.780MT

Test Parameter	Unit	Result	RMG380
Density @ 15°C	kg/m³	976.4	991.0
Viscosity @ 50°C	mm²/s	341.0	380.0
Water	% V/V	< 0.1	0.5
Micro Carbon Residue	% m/m	13	18
Sulfur	% m/m	1.72	3.50
Total Sediment Potential	% m/m	0.01	0.10
Ash	% m/m	0.04	0.15
Vanadium	mg/kg	67	300
Calcium	mg/kg	5	30
Zinc	mg/kg	< 1	15
Phosphorus	mg/kg	1	15
Pour Point	°C	< 24	30
Flash Point	°C	> 70	60
Aluminium + Silicon	mg/kg	44	80
Sodium	mg/kg	23	
Aluminium	mg/kg	19	
Silicon	mg/kg	25	
Iron	mg/kg	19	
Nickel	mg/kg	27	
Magnesium	mg/kg	< 1	
Potassium	mg/kg	1	
Net Specific Energy[1]	MJ/kg	40.82	
CCAI (Ignition Quality)[1]	-	838	

[1] Calculated value

Specification Comparison

Results compared with amended ISO 8217:2005 specification RMG380, table 2.
Based on this sample the specification is met.

Operational Advice

Al+Si - Fuel contains catalytic fines as indicated by aluminium + silicon. Increased
wear of liners, piston rings, injectors and fuel pumps is likely when these highly
abrasive particles are not reduced by at least 68%.

Separators - Fuel temperature at separator inlet should be maintained at a constant
temperature of 98 °C. Ensure a constant flow rate through the separator at a reduced rate.
Consider to operate separators in parallel. Cleaning the disc stack of the separators in
use will further improve the efficiency.

Fuel System Check - Based on the high concentration of impurities, we recommend to send a set of FSC
samples to assess the efficiency and confirm optimum operation of the fuel treatment
plant. As a minimum, representative samples taken before and after the separators are

required for this assessment. Please refer to the Instruction Manual included in the
sample kits for more detailed information.

Temperatures

Injection - 140 °C for 10 mm²/s, 125 °C for 15 mm²/s, 115 °C for 20 mm²/s, 105 °C for 25 mm²/s
Transfer - 40 °C

Calculated Weight

949.857 MT

Calculated Mass

950.929 MT

The calculated quantities are based on BDN Volume and tested density. A weight factor of 1.1 kg/m³ (ASTM D1250-80 Table 56) has been applied to calculate the weight.
Best Regards,
On behalf of Veritas Petroleum Services BV
Christian Ryder
Technical Manager

If not properly aligned, please change font to Courier New, size 10.

Reference to part(s) of this report which may lead to misinterpretation is prohibited.

For assistance or further information on this report please contact your nearest VPS
office or contact us directly at Tel : +1 (281) 470 1030, Email : Houston@v-p-s.com

Barge Name: Bernie Briere
Job No: 81446
Customer Order or Nomination No: 2505185

Terminal/Vessel Name: GRAND PRINCESS
Location: SAN FRANCISCO 27

Arrival Condition (Updated: 2017-09-05 13:31:51)

Tank	Product	API	Feet	Inches	Temp	Water Bbls	Gross Bbls	Net Bbls	Metric Tons
1P	SLURRY	-0.50	0.00	1.00	60.00	0.00	2.28	0.00	0.00
1S	SLURRY	-0.50	0.00	1.00	60.00	0.00	2.28	0.00	0.00
2C	RMG380	13.20	7.00	11.50	108.00	0.00	2,781.60	2,729.86	423.54
3P	LSMGO	39.50	5.00	6.75	88.00	0.00	3,206.61	3,163.00	415.18
3S	LSMGO	39.50	5.00	6.00	88.00	0.00	3,211.58	3,167.90	415.82
4P	SLURRY	-0.50	22.00	1.25	60.00	0.00	11.04	0.00	0.00
4S	SLURRY	-0.50	22.00	0.25	60.00	0.00	11.04	0.00	0.00
5P	RMG380	13.20	12.00	5.38	108.00	0.00	1,809.21	1,775.56	275.48
5S	RMG380	13.20	12.00	6.75	108.00	0.00	1,785.34	1,752.13	271.84

Summary of Arrival Condition

Product	A.P.I.	Water Bbls	Gross Bbls	Net Bbls	Metric Tons
SLURRY	-0.5	0.00	26.64	0.00	0.00
RMG380	13.2	0.00	6,376.15	6,257.55	970.86
LSMGO	39.5	0.00	6,418.19	6,330.90	830.99

Departure Condition (Updated: 2017-09-05 13:34:00)

Tank	Product	API	Feet	Inches	Temp	Water Bbls	Gross Bbls	Net Bbls	Metric Tons
1P	SLURRY	-0.50	0.00	1.00	60.00	0.00	2.28	0.00	0.00
1S	SLURRY	-0.50	0.00	1.00	60.00	0.00	2.28	0.00	0.00
2C	RMG380	13.20	22.00	5.00	108.00	0.00	6.82	6.69	1.04
3P	LSMGO	39.50	14.00	6.25	88.00	0.00	1,468.06	1,448.09	190.08
3S	LSMGO	39.50	14.00	5.75	88.00	0.00	1,468.48	1,448.51	190.13
4P	SLURRY	-0.50	22.00	1.25	60.00	0.00	11.04	0.00	0.00
4S	SLURRY	-0.50	22.00	0.25	60.00	0.00	11.04	0.00	0.00
5P	RMG380	13.20	21.00	8.50	108.00	0.00	65.36	64.14	9.95
5S	RMG380	13.20	21.00	8.50	108.00	0.00	59.71	58.60	9.09

Summary of Departure Condition

Product	A.P.I.	Water Bbls	Gross Bbls	Net Bbls	Metric Tons
SLURRY	-0.5	0.00	26.64	0.00	0.00
RMG380	13.2	0.00	131.89	129.44	20.08
LSMGO	39.5	0.00	2,936.54	2,896.60	380.21

Arrival	Port	Stbd	Departure	Port	Stbd
Aft	9.00	9.00	Aft	4.60	4.60
Fwd	8.30	8.30	Fwd	4.60	4.60

	TPI
Arrival	0.00
Departure	

Products Loaded (-) / Discharged (+)

Product	A.P.I.	Gross Bbls	Net Bbls	Metric Tons
SLURRY	-0.50	0.00	0.00	0.00
RMG380	13.20	6,244.26	6,128.12	950.78
LSMGO	39.50	3,481.65	3,434.30	450.79

Remarks
ARRIVED: 09/05/2017 @ 0710 START: 0825 FINISHED: 1320 EST.
DEPARTURE: 1400

Tankerman Signature & Date

BRANDON ERICKSON 09/05/2017

Terminal/Vessel Rep. Signature & Date
___ Initial here to confirm that you have read and understood the HMS legal disclaimer

M.C

MV GRAND PRINCESS
SEP 05 2017
CHIEF ENGINEER OFFICER